IN THE SPECIFICATION

Please replace the paragraph beginning at page 1, line 17, with the following rewritten paragraph:

Prior-art laboratory measuring instruments employ sample plates of many types, such as micro-sample plates, having a standardised size such that their external dimensions are the same while the number of sample wells varies. The traditional micro-sample plate originally contained 96 sample wells in ~~a 8 x 12 matrix~~ an 8 x 12 matrix. The quantity of measuring solution needed in such a sample well is about 200 µl. To reduce the amount of measuring solution, first a micro-sample plate having the same external dimensions and containing 384 sample wells in a 16 x 24 matrix was produced. The amount of measuring solution needed in each well was considerably reduced, to about 50 µl. However, when a very large number of samples are to be measured, it is preferable to use micro-sample plates with still smaller sample wells. This naturally reduces the amount of measuring solution needed. Therefore, many measuring apparatuses are nowadays implemented using micro-sample plates containing 864 wells in a 24 x 36 matrix, in which the required amount of solution ~~is e.g. about~~ is, e.g., about 10 µl, or micro-sample plates containing 1536 wells in a 32

x 48 matrix, in which the required amount of solution is only about 5 µl. The number of sample wells of the micro-sample plate may be increased still further, e.g., to 9600 sample wells in ~~a 80 x 120 matrix~~ an 80 x 120 matrix.

Please replace the paragraph beginning at page 1, line 34, with the following rewritten paragraph:

However, the use of many different sample plates has led to problems in laboratories because for each different micro-sample plate a corresponding measuring apparatus is needed. Different types of micro-sample ~~plate cannot~~ plates cannot be measured crosswise in different apparatuses. For example, a micro-sample plate containing 96 sample wells cannot be measured in an apparatus designed for plates containing 384 sample wells, nor conversely.

Please replace the paragraph beginning at page 4, line 1, with the following rewritten paragraph:

By employing the solution of the invention, a multichannel pipetting apparatus is achieved which replaces several prior-art apparatuses. A further advantage of the solution is that most

embodiments of the invention can also use pipetting tips that are previously known ~~and therefore advantageous~~.

Please replace the paragraph beginning at page 4, line 35, with the following rewritten paragraph:

A fourth preferred embodiment of the pipetting apparatus of the invention is characterised in that
the adapter is provided with a plurality of pipetting ~~tips (20)~~ tips or pipetting tip connecting elements fixedly attached to it.

Please replace the paragraph beginning at page 5, line 19, with the following rewritten paragraph:

Fig. 1 is a diagram representing a prior-art pipetting unit and associated pipetting tips in vertical section.
Fig. 2 corresponds to Fig. 1 and shows the pipetting tips as connected to the pipetting unit.
Fig. 3 corresponds to Fig. 1 and presents a second prior-art pipetting unit and associated pipetting tips.
Fig. 4 corresponds to Fig. 3 and shows the pipetting tips as connected to the pipetting unit.

Fig. 5 presents a diagrammatic vertical section of a pipetting unit according to the invention with its parts separated from each other.

Fig. 6 corresponds to Fig. 5 and presents the pipetting unit in an assembled state.

Fig. 7 corresponds to Fig. 5 and presents a pipetting unit according to a second embodiment of the invention with its parts separated from each other.

Fig. 8 corresponds to Fig. 7 and presents the pipetting unit in an assembled state.

Fig. 9 corresponds to Fig. 5 and presents a pipetting unit according to a third embodiment of the invention with its parts separated from each other.

Fig. 10 corresponds to Fig. 9 and presents the pipetting unit in an assembled state.

Fig. 11 corresponds to Fig. 5 and presents a pipetting unit according to a fourth embodiment of the invention with its parts separated from each other.

Fig. 12 corresponds to Fig. 11 and presents the pipetting unit in an assembled state.

Fig. 13 corresponds to Fig. 5 and presents a pipetting unit according to a fifth embodiment of the invention with its parts separated from each other.

Fig. 14 corresponds to Fig. 13 and presents the pipetting unit in an assembled state.

Fig. 15 corresponds to Fig. 5 and presents a pipetting unit according to a sixth embodiment of the invention with its parts separated from each other.

Fig. 16 corresponds to Fig. 15 and presents the pipetting unit in an assembled state.

Fig. 17 corresponds to Fig. 5 and presents a pipetting unit according to a seventh embodiment of the invention with its parts separated from each other.

Fig. 18 corresponds to Fig. 17 and presents the pipetting unit in an assembled state.

Fig. 19 presents a section taken of the unit in Fig. 5 along line XIX-XIX.

Fig. 20 presents a section taken of the unit in Fig. 7 along line XX-XX.

Fig. 21 presents a section taken of the unit in Fig. 9 along line XXI-XXI.

Fig. 22 presents a section taken of the unit in Fig. 13 along line XXII-XXII.

Fig. 23 corresponds to Fig. 5 and presents a pipetting unit according to an eighth embodiment of the invention with its parts separated from each other.

Fig. 24 presents a diagrammatic vertical section through a pipetting unit according to a ninth embodiment of the invention and its replaceable parts.

Fig. 25 corresponds to Fig. 5 and presents a diagrammatic vertical section through a pipetting unit according to a tenth embodiment of the invention.

Fig. 26 presents a diagrammatic top view of a second pipetting apparatus according to the invention.

Fig. 27 presents a diagrammatic lateral view of the pipetting apparatus in Fig. 26.

Fig. 28 presents an axonometric view of a third pipetting apparatus according to the invention.

Fig. 29 presents the replaceable part of the pipetting unit according to the invention in top view.

Fig. 30 corresponds to Fig. 29 and presents a second embodiment of the replaceable part of the pipetting unit in top view.

Fig. 31 presents a diagram visualising the layout of the flow channels of the pipetting unit of the invention.

Fig. 32 corresponds to Fig. 29 and presents a top view of a third embodiment of the replaceable part of the pipetting unit.

Fig. 33 presents a diagrammatic vertical section of a pipetting unit according to an eleventh embodiment of the invention.

Fig. 34 corresponds to Fig. 33 and presents the pipetting unit in another position.

Please replace the paragraph beginning at page 7, line 27, with the following rewritten paragraph:

After this, the liquid can be dosed into the sample wells or separate containers in another sample plate which have been arranged in the way as the sample wells or separate ~~containers use~~ containers used as pipetting sources. The receiving sample wells also have to be disposed at the same distances between them as the sample wells or separate containers used as pipetting sources.

Please replace the paragraph beginning at page 8, line 14, with the following rewritten paragraph:

However, using the prior-art apparatus, it is difficult to pipette, e.g., from a sample plate containing 24 sample wells into a micro-sample plate containing 384 sample wells. This is generally due to the fact that pipetting tips designed for larger sample wells are too large to be inserted into smaller sample wells. Obviously enough, 384 sample wells accommodated in a sample plate of the same size must be considerably smaller than e.g. the sample wells in a micro-sample plate containing 96 sample wells. Therefore, it is generally likewise impossible to pipette from a micro-sample plate containing 96 sample wells into another micro-sample plate containing 1536 sample wells. It is true that pipetting can be performed using pipetting tips that are small enough to be inserted into small sample wells. In this case, however, there is the problem that the pipetting tips can only contain such a small amount of liquid that filling larger sample wells is a very slow operation. The pipetting would have to be repeated several times. Therefore, in current practice several pipetting units of different sizes are needed to enable dosage operations as described above to be carried out efficiently.

Please replace the paragraph beginning at page 8, line 29, with the following rewritten paragraph:

Fig. 3 presents another prior-art pipetting unit 10 which also uses separate pipetting tips 20. The pipetting tips 20 are pressed into connecting elements 15 placed opposite to the dosage cylinders 12 in the frame 16 of the pipetting unit 10. In this example, the connecting elements 15 and the pipetting tips 20 are so closely fitted that no separate seals are needed. However, there are many different ways of connecting the pipetting tips 20a, including solutions in which one or more seals, ~~such as e.g. O-rings,~~ such as, e.g., O-rings are used.

Please replace the paragraph beginning at page 9, line 17, with the following rewritten paragraph:

The lower surface of the adapter 30a is provided with a seal 14b which is identical to the seal 14 on the lower surface of the pipetting unit 10. Thus, both the joint between the adapter 30a and the frame 16 of the pipetting unit 10 and the joint between the implement and the pipetting tips 20a are sealed. Fig. 5 also shows that the pipetting tips 20a and their support plate 21a are identical to those in the prior-art pipetting unit 10 presented ~~Fig. 1 and 2~~ in Figs. 1 and 2. In other words, known standard-type pipetting tips can be used in this embodiment of the pipetting unit

10 of the invention. Fig. 6 presents a pipetting unit 10 according to the invention in an assembled state and ready for use. The inventive significance of the adapter 30a is described in connection with the following figures.

Please replace the paragraph beginning at page 10, line 1, with the following rewritten paragraph:

Fig. 8 presents the pipetting unit 10 of Fig. 7 in an assembled state. In the embodiments in ~~Fig. 7 and 8~~ Figs. 7 and 8, the pipetting unit 10 and its frame 16 may be the same as in the previous figures, in other words, the apparatus is a pipetting unit 10 (known in itself) in which only an adapter 30b according to the invention has been changed. At the same time, the adapter 30b has been fitted with larger pipetting tips 20b, which, however, may also consist of existing, i.e., known standard-type pipetting tips 20b. The essential point about the solutions presented in ~~Fig. 5-8~~ Figs. 5-8 is that, by using different adapters 30a and 30b, the known basic part 16 of a pipetting unit 10 and known pipetting tips 20b can be used in considerably more versatile ways than before. In other words, a simple solution enables a single apparatus to function like two or more prior-art apparatuses together.

Please replace the paragraph beginning at page 10, line 13, with the following rewritten paragraph:

Fig. 9 presents yet another variation of the solutions presented in ~~Fig. 5-8~~ Figs. 5-8. In this case, a channel 31c in the third adapter 30c according to the invention connects the dosage orifices 13 of four dosage cylinders 12 in a cross-sectional view to a larger orifice 32c, which again is connected to a pipetting tip 20c of conventional type. Here, too, it is to be noted that the channels 31c in the adapter 30c connect four dosage cylinder 12 dosage orifices 13 in both widthways and lengthways directions of the adapter 30c, each pipetting tip 20c being thus connected to sixteen dosage cylinder 12 dosage orifices 13, as is later shown in the cross-sectional view in Fig. 21. Fig. 10 presents the pipetting unit 10 of Fig. 9 in an assembled state.

Please replace the paragraph beginning at page 10, line 23, with the following rewritten paragraph:

In a way, the pipetting units 10 presented in ~~Fig. 6-10~~ Figs. 6-10 form part of the same entity, in which the basic part of the pipetting unit 10 and the frame 16 comprised in it and containing

the dosage cylinders ~~is the same~~ are the same in all these figures. Thus, by only changing the adapter 30 and the associated individual pipetting tips 20 (known in themselves), pipetting can be performed efficiently between micro-sample plates or corresponding separate containers of widely varying sizes.

Please replace the paragraph beginning at page 10, line 30, with the following rewritten paragraph:

As generally a single pipetting tip size is well applicable for pipetting two or three different-sized sample wells, it is possible, by alternately using apparatuses as presented in ~~Fig. 6-10~~ Figs. 6-10, to pipette efficiently and quickly at least 6-7 differently sized sample wells by means of three pipetting tips 20a-20c of different sizes. In practice, this is enough to allow pipetting of all sample wells of different sizes needed in laboratory work. However, if a still wider range of application is required, then, according to the invention, the number of adapters 30 used in the pipetting unit 10 can be increased still further.

Please replace the paragraph beginning at page 11, line 1, with the following rewritten paragraph:

~~Fig. 11 and 12~~ Figs. 11 and 12 present an embodiment comprising a pipetting unit 10 and channels 31d in an adapter 30d which in the cross-sectional view connect two dosage cylinders 12 to one orifice 32d and further to a pipetting tip 20d. As in the embodiment in Fig. 7, the channels 31d connect two dosage cylinders 12 in both widthways and lengthways directions of the adapter 30d. Each pipetting tip 20d is thus connected to four dosage cylinders 12.

Please replace the paragraph beginning at page 11, line 7, with the following rewritten paragraph:

As a difference from Fig. 7, the channels 31d in the adapter 30d in ~~Fig. 11 and 12~~ Figs. 11 and 12 are fitted directly without separate seals to the connecting elements 15a added to the frame 16. The orifices 32d in the adapter 30d are provided with corresponding connecting elements 15b for the pipetting tips 20d.

Please replace the paragraph beginning at page 11, line 12, with the following rewritten paragraph:

~~Fig. 13 and 14~~ Figs. 13 and 14 present an embodiment in which the adapter 30e is provided with channels 31e which in the cross-sectional view connect four dosage cylinders 12, i.e., in the widthways and lengthways directions a total of sixteen dosage cylinders 12 to one orifice 32e, and further to a pipetting tip 20e of a known type. In this embodiment, too, the adapter 30e can be connected via the orifices of the channels 31e to the connecting elements 15a of the frame 16 of the pipetting unit 10 without separate seals. Similarly, a conventional pipetting tip 20e can be connected to the connecting element 15e of the adapter 30e without separate seals. A sectional view of this adapter 30e is presented in Fig. 22.

Please replace the paragraph beginning at page 11, line 21, with the following rewritten paragraph:

The solutions presented in ~~Fig. 10-14~~ Figs. 10-14 are also in a way part of the same entity in which different adapters 30 and pipetting tips 20, conventional in themselves but of different sizes, connected to them can be used in connection with the basic part of the pipetting unit 10 and its frame 16. In this way, a very

wide range of use of the same multichannel pipetting apparatus is achieved in the pipetting of sample wells of different sizes.

Please replace the paragraph beginning at page 11, line 26, with the following rewritten paragraph:

~~Fig. 15 and 16~~ Figs. 15 and 16 present an embodiment of a pipetting unit 10 in which the upper surface of the adapter 30f is provided with a seal 14f. In this case, the adapter 30f can be fitted tightly against the lower surface 17 of the frame 16 of the pipetting unit 10 as an alternative to connection to connecting elements 15a, which was the case in the previous example. In this example, one large common channel 31f connects four adjacent dosage cylinders 12 arranged in a quadratic array to a single orifice 32f.

Please replace the paragraph beginning at page 11, line 34, with the following rewritten paragraph:

The adapter 30f can also be varied in numerous other ways by combining different types of joint at its upper and lower surfaces. The drawings and this description do not present all these alternatives. For example, the lower surface of adapter 30f may be

straight, as in Fig. 7, and provided with a seal 14 instead of connecting elements 15f. In this case, in place of pipetting tips 20d, there will be standard-type pipetting tips 20b together with a support plate 21b, as in Fig. 7.

Please replace the paragraph beginning at page 12, line 4, with the following rewritten paragraph:

~~Fig. 17 and 18~~ Figs. 17 and 18 present a solution resembling the one presented in ~~Fig. 15 and 16~~ Figs. 15 and 16, likewise with a seal 14g on the upper surface of the adapter 30g. The difference in this example is that, instead of connecting four dosage cylinders 12 of the frame 16 of the pipetting unit 10, one large common channel 31g connects sixteen dosage cylinders 12 to an orifice 32e in the adapter 30g and further to a pipetting tip 20e of a known type.

Please replace the paragraph beginning at page 12, line 10, with the following rewritten paragraph:

~~Fig. 19-22~~ Figs. 19-22 present horizontal sections through certain alternative adapters 30a, 30b, 30c and 30e. In the adapter

30a in Fig. 19, each channel 31a connects only one dosage cylinder directly to one pipetting tip, as shown in Fig. 5 and 6.

Please replace the paragraph beginning at page 12, line 14, with the following rewritten paragraph:

In the adapter 30b in Fig. 20, each channel 31b connects four dosage cylinders 12 in the frame 16 of the pipetting unit 10 to one orifice 32b in the adapter 30b and further to a pipetting tip 20e of a known type as shown in ~~Fig. 7 and 8~~ Figs. 7 and 8.

Please replace the paragraph beginning at page 12, line 18, with the following rewritten paragraph:

In the adapter 30c in Fig. 21, a large common channel 31c connects sixteen dosage cylinders of the pipetting unit 10, arranged in a quadratic array, to one orifice 32c and further to a pipetting tip of a known type. A vertical section of a corresponding pipetting unit is presented in ~~Fig. 9 and 10~~ Figs. 9 and 10.

Please replace the paragraph beginning at page 12, line 23, with the following rewritten paragraph:

The adapter 30e in Fig. 22 contains several small channels 31e which also connect sixteen dosage cylinders of the pipetting unit 10 to one orifice 32e and further to a pipetting tip of a known type as in the previous figure. However, there is a difference in the structure of the channel system, in which, instead of a single large space, several small channels are connected to the orifice 32e. A vertical section of a pipetting unit 10 corresponding to this embodiment is shown in ~~Fig. 13 and 14~~ Figs. 13 and 14.

Please replace the paragraph beginning at page 12, line 30, with the following rewritten paragraph:

Fig. 23 presents a pipetting unit 10 with an adapter 30b like that in ~~Fig. 7 and 8~~ Figs. 7 and 8. However, the frame 16 of the pipetting unit 10 differs in that the dosage cylinders are located at a distance from the adapter 30b. The dosage cylinders, which are not shown in Fig. 23, are connected via tubes 18 to the dosage orifices 13 of the frame 16.

Please replace the paragraph beginning at page 12, line 35, with the following rewritten paragraph:

Fig. 24 presents a pipetting unit 10 to whose frame 16 it is possible to alternatively connect one of three different adapters 30 provided with fixed pipetting tips 23 or with separate pipetting tips 20a placed over them. The adapter 30h in Fig. 24a has one fixed pipetting tip for each dosage cylinder 12 of the pipetting unit 10. The adapter 30i in Fig. 24b again has one fixed pipetting tip 23I or a separate pipetting tip 20b placed over it for four dosage cylinders 12 of the pipetting unit 10. The adapter 30j in Fig. 24c again has one fixed pipetting tip 23j or a separate pipetting tip 20c placed over it for sixteen dosage cylinders 12 of the pipetting unit 10. In the embodiments presented in Fig. 24, fixed pipetting tips 23 can be used, e.g., when the apparatus is mainly used for only dosing a liquid. To transfer a liquid from a sample plate to another by pipetting, it is generally necessary to use replaceable separate tips 20.

Please replace the paragraph beginning at page 13, line 25, with the following rewritten paragraph:

The pipetting process can be varied depending on the type of micro-sample plate under pipetting simply by moving one of the zones 22a, 22b or 22c of the adapter 30k to the position directly opposite to the dosage orifices 13 of the dosage cylinders of the pipetting unit 10. As described above, the pipetting tips in this embodiment are fixedly joined to the adapter 30k. Alternatively, it is naturally also possible to use separate, preferably standard-type pipetting tips either in addition to the fixed pipetting tips 23, e.g. by placing them over these, or instead of these. When separate pipetting tips 20 are used, the apparatus can also be so implemented that either the measuring head of the pipetting unit 10 or the movable adapter 30k fetches new pipetting tips when necessary.

Please replace the paragraph beginning at page 14, line 33, with the following rewritten paragraph:

Fig. 28 presents a pipetting apparatus 40 which is a simplified version of the apparatus presented in ~~Fig. 26 and 27~~ Figs. 26 and 27, and in which the micro-sample plates 42 are fed onto the track 41 from a feed device 43. The pipetting unit 10 above the track 41 is provided with a movable adapter 30 with three

replaceable pipetting tip groups 22. The pipetting unit 10 can fetch a new group to replace a pipetting tip group 22 when necessary. The pipetting tips may be fixed or separate tips.